

"APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7

APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7"

"APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7

APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7"

"APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7

APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7"

"APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7

APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7"

"APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7

APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7"

ACCESSION NR: AP4041763

8/0076/64/038/006/1677/1679

AUTHOR: Kochergin, S. M.; Kargina, N. M.

TITLE: A comparative study of the texture of electrodeposited silver.

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 6, 1964, 1677-1679

TOPIC TAGS: silver, electroplating, metallography, electron microscopy, silver plating, surface property

ABSTRACT: Because silver compounds display semiconductor properties silver and its compounds began to attract a great deal of attention. The purpose of this work was to expand our knowledge of this field of interest. The obtained results may help the interpretation of the surface properties of silver. The electrolytic deposits of silver were obtained in a 200 cm³ electrolyzer on copper foil cathodes, silver plated in some cases. The thickness of the deposit was 25 - 50 microns. The surface structure was investigated by electron microscopy and the texture -- by means of x-ray diffraction. Grain sizes were calculated from the x-ray diffraction patterns and were compared with the electron microscopy data. The texture was formed along the $[011]$ and $[111]$ axis. Very often silver deposits had no preferred

Card 1/2

ACCESSION NR: AP4041763

grain orientation. The electrolytic deposits from different electrolytes differ in grain size. Variations in grain sizes are also observed within one deposit. The mutual orientation of grains in silver deposits was small. The large nonuniformity of grains may be the cause of the significant nonuniformity of the properties of silver deposits. Orig. art. has: 1 table and 4 figures.

ASSOCIATION: Kazanskiy khimiko-tekhnologicheskii institut (Kazan' Institute of Chemical Technology)

SUBMITTED: 11Jul63

ENCL: 00,

SUB CODE: MM, SS

NO REF SOV: 007

OTHER: 004

Card 2/2

KOCHERGIN, S.M.; BARABANOV, V.P.; TSENTOVSKIY, V.M.

Polyelectrolytic behavior of solutions of the copolymers of
methacrylate and chloroacrylic acid. Izv.vys.ucheb.zav.;
khim. i khim.tekh. 8 no.2:301-304 '65.

(MIRA 18:8)

L. Kazanskij khimiko-tekhnologicheskij institut imeni Kirova,
kafedra fizicheskoy i kolloidnoy khimii.

L 6478-66 ENT(m)/EWA(d)/ENF(t)/ENP(z)/ENP(b)/EWA(h) IJP(c) HJW/JD
ACC NR: AP5025661 SOURCE CODE: UR/0080/65/038/010/2337/2339

AUTHOR: Kochergin, S. M.; Moiseyenko, S. K.

ORG: none

TITLE: Investigation of effective solutions for decontamination¹⁹ in the ultrasonic field of duralumin and St-3 steel contaminated with Co⁶⁰

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 10, 1965, 2337-2339

TOPIC TAGS: aluminum alloy, mild steel, radioactive contamination, cobalt 60 contamination, alloy decontamination, steel decontamination, ultrasonic decontamination, decontamination solution/D5 duralumin, St3 steel

ABSTRACT: A study has been made of various decontaminants used in the ultrasonic cleaning of materials contaminated with radioactive isotopes. Specimens of D-5 aluminum alloy and St-3 steel were contaminated in a sulfuric acid solution of Co⁶⁰ with a specific radioactivity of 0.8 $\mu\text{Ci/ml}$. The degree of contamination varied from the maximum level permissible for the equipment under laboratory conditions to a level ten times higher. Decontamination was done at a frequency of 21-23 kc and a power output of 1-1.5 W/cm^2 , at $20 \pm 1^\circ\text{C}$. The most effective solutions for decontamination of D-5 alloy were: 1) 10% H_2SO_4 + 15 g/l KMnO_4 ; 2) 10% HNO_3 ; and 3) 10% H_2SO_4 + 15 g/l $\text{K}_2\text{Cr}_2\text{O}_7$. A 99.5% decontamination was achieved in these solutions in 2.5, 3, and 5 min, respectively; the respective weight loss of the specimens was 0.5,

Card 1/2

UDC: 669.715+669.140+537-96

0701 1713

L 6478-66

ACC NR: AP5025661

2.5, and 1.0%. A higher decontamination rate, but with a higher weight loss, was observed in 30% acid solutions. Decontamination of the specimens four days after contamination required twice as much time and caused almost double weight loss. A 99.5% decontamination of St-3 steel in the solutions 1, 2, and 3 was achieved in 1.5, 1.0, and 3 min with a weight loss of 2.5, 6.0, and 3%, respectively. Co^{60} is, for the most part, absorbed at various defects of the metal surface (nicks, scratches, etc.). A 30—45 sec ultrasonic treatment completely removes Co^{60} from the surface of oxide films, but the removal of Co^{60} , which penetrated deep into the oxide film, proceeds much more slowly. The protective oxide films, which are formed during dissolution of contaminated metal, prevent secondary sorption of Co^{60} at the metal surface. Hence, it can be assumed that the recommended solutions can be sufficiently effective in other analogous decontamination processes. (MS)

SUB CODE: MM, IE/ SUBM DATE: 19Dec63/ ORIG REF: 005/ OTH REF: 009/ 4/39
ATD PRESS:

nm
Cord 2/2

KOCHERGIN, S.V.; GORYUSHKIN, F.F., dorozhnyy master; BORISENKO, D.G., brigadir;
GRINEVICHUS, E.A. [Grinevichus, E.]; KURS, V.G., brigadir; SELIONOV, S.I.;
BEN'KOVSKIY, V.Ya.; PIRIYEV, A.M.

Letters to the editor. Put' i put.khos. 7 no.2:36-37 '63. (MIRA 16:2)

1. Zamestitel' nachal'nika Rossoshanskoy distantzii Yugo-Vostochnoy dorogi (for Kochergin).
2. Stantsiya Kudinovo, Moskovskoy dorogi (for Goryushkin).
3. Stantsiya Rahanitsa, Moskovskoy dorogi (for Borisenko).
4. Starshiy dorozhnyy master, stantsiya Klaypeda, Litovskoy dorogi (for Grinevichus).
5. Stantsiya Cherekhovo, Vostochno-Sibirskoy dorogi (for Kurs).
6. Zamestitel' nachal'nika distantzii, Manzovka, Dal'nevostochnoy dorogi (for Selionov).
7. Nachal'nik otdela sashchitnykh lessnasashdeniy sluzhby puti, g.Kuybyshev (for Ben'kovskiy).
8. Zamestitel' nachal'nika distantzii, Khachmaz, Azerbaydzhanskoy dorogi (for Piriyeu).

(Railroads--Track)

CHERNOMBYL'SKIY, I.I. [Choronobyl's'kiy, I.I.], doktor tekhn. nauk; LUVACH,
Yu.Ye. [Iukash, IU.IE.], kand. tekhn. nauk; GAYENKII, B.A. [Halevs'kiy,
B.A.], kand. tekhn. nauk; KOCHERGIN, V.I. [Kocherhin, V.I.]

Apparatus for studying heat transfer to the moving polyethylene
melt. Khim. prom. no.4:43-44 O-D '64.

Determining the coefficients of heat transfer to a moving
polyethylene melt. Ibid.:45 (MCRA 18:3)

CHERNOBYLSKIY I.I., doktor tekhn. nauk; KOCHERGIN, V.L., inzh.

Investigating heat transfer in the viscous flow of polymers in
straight-line channels with a round cross section. Khim.
mashinostr. no.1:67-73 '65. (MIRA 18:9)

DUNAYEV, N.I., insh. (g.Svobodnyy); KANTEMIROV, D.D., insh. (g.Svobodnyy);
FEDORINA, F.T., insh. (g.Svobodnyy); KOCHERGIN, V.N., insh.
(Svobodnyy); PEVZNER, S.L., insh. (g.Svobodnyy)

"Organization of the work in a railroad section" by IU.I.Zelenskii,
P.S.Tikhomirov. Reviewed by N.I.Dunaev and others. Zhel.dor.
transp. 43 no.11:94-96 N '61. (MIRA 14:11)

(Railroads--Management)
(Zelenskii, IU.I.)
(Tikhomirov, P.S.)

OLUSHKO, M.Ye., insh.; KOCHERSKIN, V.M., insh.; NITROFANOVA, M.A., insh.

Experience in using specialized cars for intrafactory traffic at
the Dzerzhinskii Works. Bul. TSNIIKHM no.3:46-50 '58. (MIRA 11:5)
(Railroads, Industrial—Freight cars)

Kocherov, V.N.
KOCHEROV, V.N., klinicheskiy ordinator

X-ray diagnosis of peacetime skull wounds. Sbor.trud.Tashk.KEMP
no.1:206-214 '56 (MIRA 11:7)
(SKULL--FRACTURE)

KOCHERGIN, V. N., Cand Med Sci -- (diss) "Problem of prophylaxis of occupational skin lesions of silkwinding mill workers." Tashkent, 1957, 16 pp (Tashkent State Medical Institute im V. M. Molotov), 200 copies (KL, 36-57, 107)

EXCERPTA MEDICA Sec 13 Vol 13/8 Dermatology Aug, 59

1988. PROTECTIVE PASTE FOR PROPHYLAXIS OF DERMATITIDES AND
BURNS OF WORKERS IN SILK WINDING MILLS (Russian text) -
Kochergin V. N. - From the symposium: VOPR. DERM. I VENEH.
(Tashkent) 1957 (181-184)

The use of a protective paste, consisting of cotton-seed oil (75%), zinc oxide (5%),
talcum (15%) and boric acid (5%), by the female workers employed at silk winding
mills, has resulted in a marked decline of occupational skin diseases amongst
those workers. The slightly warmed paste, applied to clean dry skin, forms a thin
hydrophobic coating on its surface, protecting the skin from the macerating effect
of the water, the high temperatures, the harmful effect of the toxic substances ex-
tracted from the cocoons and from bacteria. The paste does not influence the
physicomechanical qualities of the silk thread, does not damage the yarn and does
not irritate the skin.

Mashkilleison Jr - Moscow (5)

KOCHEROIN, V.N., kand.med.nauk (g. Beloretak)

Prevention of occupational diseases of the hand among workers of
silk spinning plants. Fel'd. i akush. 25 no.1:21-25 Ja '60.

(MIRA 13:4)

(TEXTILE WORKERS--DISEASES AND HYGIENE)
(UKRAINE--SILK MANUFACTURE AND TRADE)
(HAND--DISEASES)

KOCHERGIN, V.N., kand.med.nauk (Andishan, ul. Bil'dina, d.25)

Case of duplication of the gall bladder. Vest.khir. 85 no.11:
124-125 N '60. (MIRA 14:2)

1. Is kafedry rentgenologii i radiologii (sav. - V.N. Kochergin)
Andishanskogo meditsinskogo instituta.
(GALL BLADDER—ABNORMALITIES AND DEFORMITIES)

KOCHERGIN, V.N.

Case of syphilis of the esophagus. Med. zhur. Uzb. no.4:56-57 Ap
'61. (MIRA 14:5)

1. Iz kafedry rentgenologii i radiologii Andishanskogo gosudarstvennogo
meditsinskogo instituta.
(ESOPHAGUS—SYPHILIS)

KOCHEROIN, V.N., kand.med.nauk

Device for examining the skull in patients under difficult conditions.
Vest. rent. i rad. 36 no. 2:60-61 Mr-Ap '61. (MIRA 14:4)

1. Iz kafedry rentgenologii i radiologii (sav. - prof. D.M. Abdurasulov)
Tashkentskogo instituta usovershenstvovaniya vrachey.
(SKULL—RADIOGRAPHY)

21(9)

AUTHORS:

Kochergin, V. P., Orlov, V. V.

SOV/89-6-1-4/33

TITLE:

Length of the Moderation of Neutrons (Dlina zamedleniya neytronov)

PERIODICAL:

Atomnaya energiya, 1959, Vol 6, Nr 1, pp 34 - 41 (USSR)

ABSTRACT:

The integral equation of the moments of the neutron spatial distribution function in an infinite medium with infinitely thin isotropic sources is derived and an approximated solution for the equation is developed. The energy moments and angle-moments of the neutron distribution function are expressed by the experimentally determinable angular distribution of the neutrons for the case of an anisotropic elastic scattering on the nuclei for various neutron energies. By making use of the experimental data for the total cross section and the angular distribution of elastic neutron scattering on the nuclei H^1 , D^2 , Be^9 , C^{12} and O^{16} formulae were derived for the moderation length of the neutrons. By means of these formulae the moderation length in the following moderators was determined: water, heavy water, graphite, beryllium, and beryllium oxide. A comparison between

Card 1/2

Length of the Moderation of Neutrons

SOV/89-6-1-4/33

experimental and calculated values shows that the latter agree with the former with an accuracy of up to about 1 %. Work was discussed with G. I. Marchuk, Doctor of Physico-Mathematical Sciences. V. S. Gudkov, Z. P. Drobyshev, and Z. I. Shemetenko took part in the calculation work. There are 4 figures, 1 table, and 4 references.

SUBMITTED: June 21, 1958

Card 2/2

4.680
5/869/62/000/000/004/012
B102/B186

21.10.00

AUTHORS: Marchuk, G. I., ~~Kochergin, V. P.~~, Pogudalina, Ye. I.,
Kusnetsova, L. I.

TITLE: Application of an effective one-group method to calculating of
nuclear reactors

PERIODICAL: Teoriya i metody rascheta yadernykh reaktorov; sbornik
statey. Ed. by G. I. Marchuk. Moscow, Gosatomizdat, 1962,
79 - 85

TEXT: Several problems on applying one-group methods to criticality
calculations are discussed. Though one-group approximation is less accurate
than multi-group methods, it can be used for improving the critical
parameters. Since e.g. the formulas for averaging the constants are
fractional-linear functionals it is possible to average the constants with-
out needing to use the true solutions of the reactor equations. This can
be done by any approximate solution to these equations, e.g. the diffusion
or P_1 -approximation. The constants then used for calculating the critical
parameters yield a better approximation than P_1 . Several variants of

Card 1/4

S/869/62/000/000/004/012

B102/B186

Application of an...

applying one-group reactor equations are analyzed. If the system of reactor equations

$$\left. \begin{aligned} \nabla \varphi_1 + \Sigma \varphi_0 &= \int_{u=r}^u \Sigma_f(u-u') \varphi_0(r, u') du' \\ &+ \int_{-\infty}^u \Sigma_{in}(u') \alpha(u, u') \varphi_0(r, u') du' + \chi(u) \lambda(r); \\ \frac{1}{\beta} \nabla \varphi_0 + \Sigma \varphi_1 &= \int_{u=r}^u \Sigma_f(u-u') \varphi_1(r, u') du' \end{aligned} \right\} \quad (1)$$

is represented as multi-group equations in P_1 approximation, the effective one-group constants are

$$\bar{\Sigma}_c = \frac{\int dr \varphi_0^* \bar{\Sigma}_c \varphi_0}{\int dr \varphi_0^* \varphi_0}, \quad \bar{\Sigma}_f = \frac{\int dr \varphi_0^* \chi(r)}{\int dr \varphi_0^* \varphi_0}, \quad \bar{\Sigma}_{:r} = \frac{\int dr \nabla \varphi_0^* \nabla \varphi_0}{\int dr \nabla \varphi_0^* \varphi_1} \quad (10)$$

where

Card 2/4

Application of an...

S/869/62/000/060/004/012
B102/B186

The one-group constants can be used for improving the critical mass parameters by solving the one-group kinetic equation

$$\Omega \nabla^2 \phi + \bar{\Sigma}_{tr} \phi = \frac{\bar{\Sigma}_{tr} - \bar{\Sigma}_0 + v \bar{\Sigma}_f}{4\pi} \int \phi d\Omega \quad (11)$$

with the method of spherical harmonics. This is done for a spherical reactor with infinite water reflector. The critical mass of aqueous solutions of 90% enriched UO_2F_2 is calculated in P_3 -approximation using the above described one-group method and a multi-group method. The deviation is ~5%. Similar calculations are carried out for uranium graphite systems. There are 3 figures.

Card 4/4

MARCHUK, G.I.; ILYASOVA, G.A.; KOLESOV, V.Ye.; KOCHERGIN, V.P.;
KUZNETSOVA, L.P.

[Critical mass of aqueous mixtures of uranium and plutonium
compounds] Kriticheskie massy vodnykh smesei soedinenii
urana i plutoniia. Moskva, Glav. upr. po ispol'zovaniiu
atomnoi energii, 1960. 23 p. (MIRA 17:1)
(Uranium compounds) (Plutonium compounds)

MARCHUK, G.I.; ILYASOVA, G.A.; KOLESOV, V.Ye.; KOCHERGIN, V.P.;
KUZNETSOVA, L.I.; POGUDALINA, Ye.I.

[Critical masses of uranium - beryllium reactors] Kriti-
cheskie massy uran-berillievykh reaktorov. Moskva, Glav.
upr. po ispol'zovaniyu atomnoi energii, 1960. 8 p.
(MIRA 17:1)

MARCHUK, G.I.; KOCHEROIN, V.P.

[Approximate method for calculating the critical masses
of spherical reactors with infinite reflectors] Pribli-
zhennyi metod rascheta kriticheskikh mass sfericheskikh
reaktorov s beskonechnym otrazhatel'm. Moskva, Glav.
upr. po ispol'zovaniyu atomnoi energii, 1960. 12 p.
(MIRA 17:1)

MARCHUK, G.I.; ILYASOVA, G.A.; KOLESOV, V.Ye.; KOCHERGIN, V.P.;
KUZNETSOVA, L.I.; POGUDALINA, Ye.I.

[Critical masses of uranium-graphite reactors] Kriticheskie massy uran-grafitovykh reaktorov. Moskva, Glav. upr. po ispol'zovaniyu atomnoi energii, 1960. 17 p.
(MIRA 17:1)

K. ON-ROIN, V. P.

67722

USSR/Chemistry - Amalgams, Tin
Chemistry - Electrocapillarity

Apr 1946

"Research on the Electric Capillary Phenomenon in
Amalgams of Tin and Blometh," S.V. Karpachov, V.P.
Kosbergin, Ye.F. Jordan, Electrochem Lab, Ural
Affiliate, Acad Sci USSR, Sverdlovsk, 6 pp

"Zur Pt Kinn" Vol XII, No 4, 571

Electrocapillary phenomenon in amalgams of tin
evidence minimum surface tension, while amalgams
of blometh evidence maximum surface tension. Con-
ducted studies to determine the elasticity of mercury
vapors on subject amalgams at temperatures of
67722

USSR/Chemistry - Amalgams, Tin (Cont'd) Apr 1946
400°. Submitted 25 Jul 1947.

67722

KUZNETSOV, V.A.; KOCHERGIN, V.P.; TISHCHENKO, M.V.; POZDNYsheva, Ye.G.; FRUMKIN, A.N., ~~akademik~~

Investigation of surfaces tension of the alloy: tin - cadmium on the boundary with the fused eutectic: Li - KCl in a vacuum. Dokl.AN SSSR 92 no.6:1197-1199 0 '59. (MLMA 6:10)

1. Akademiya nauk SSSR (for Frumkin). 2. Ural'skiy gosudarstvennyy universitet im. A.M.Gor'kogo, gorod Sverdlovsk (for Kuznetsov, Kochergin, Tishchenko and Pozdnysheva). (Cadmium-tin alloys) (Surface tension)

"APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7

APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7"

"APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7

APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7"

KOCHEROIN, V.P.; KHAYBULLINA, L.O.; POTAPOVA, O.G.

Dissolving iron in molten zinc, alkali metal, and alkali earth
metal chlorides. Zhur. neorg. khim. 1 no.11:2617-2622 N '56.
(MIRA 10:5)

1. Ural'skiy gosudarstvennyy universitet im. A.M. Gor'kogo,
Sverdlovsk.
(Iron) (Chlorides) (Solubility)

"APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7

APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7"

Kochergin V.P.

USSR/Thermodynamics - Thermochemistry, Equilibria.
Physical-Chemical Analysis. Phase Transitions.

B-8

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18507

Author : V.P. Kochergin, M.S. Carpinenko, O.N. Skornyakova,
M.Sh. Minullina.

Title : Dissolution of Iron in Melted Chlorides of Alkali and
Alkali Earth Metals.

Orig Pub : Zh. prikl. khimii, 1956, 29, No 4, 566-569

Abstract : Experimental samples of Fe were immersed into melted
eutectic mixtures (BaCl_2 and KCl), (CaCl_2 and NaCl) and
(MgCl_2 and KCl) and the amount of Fe passed over into
the melts at 700° was found by the sample weight decrea-
se and by the analytical determination of Fe contents
in the mixed chlorides. The curves of the dissolution
speed show that this decrease diminishes at the transi-
tion from the eutectic of MgCl_2 and KCl to the eutectic
of BaCl_2 and KCl . If the ions of H were eliminated

Card 1/2

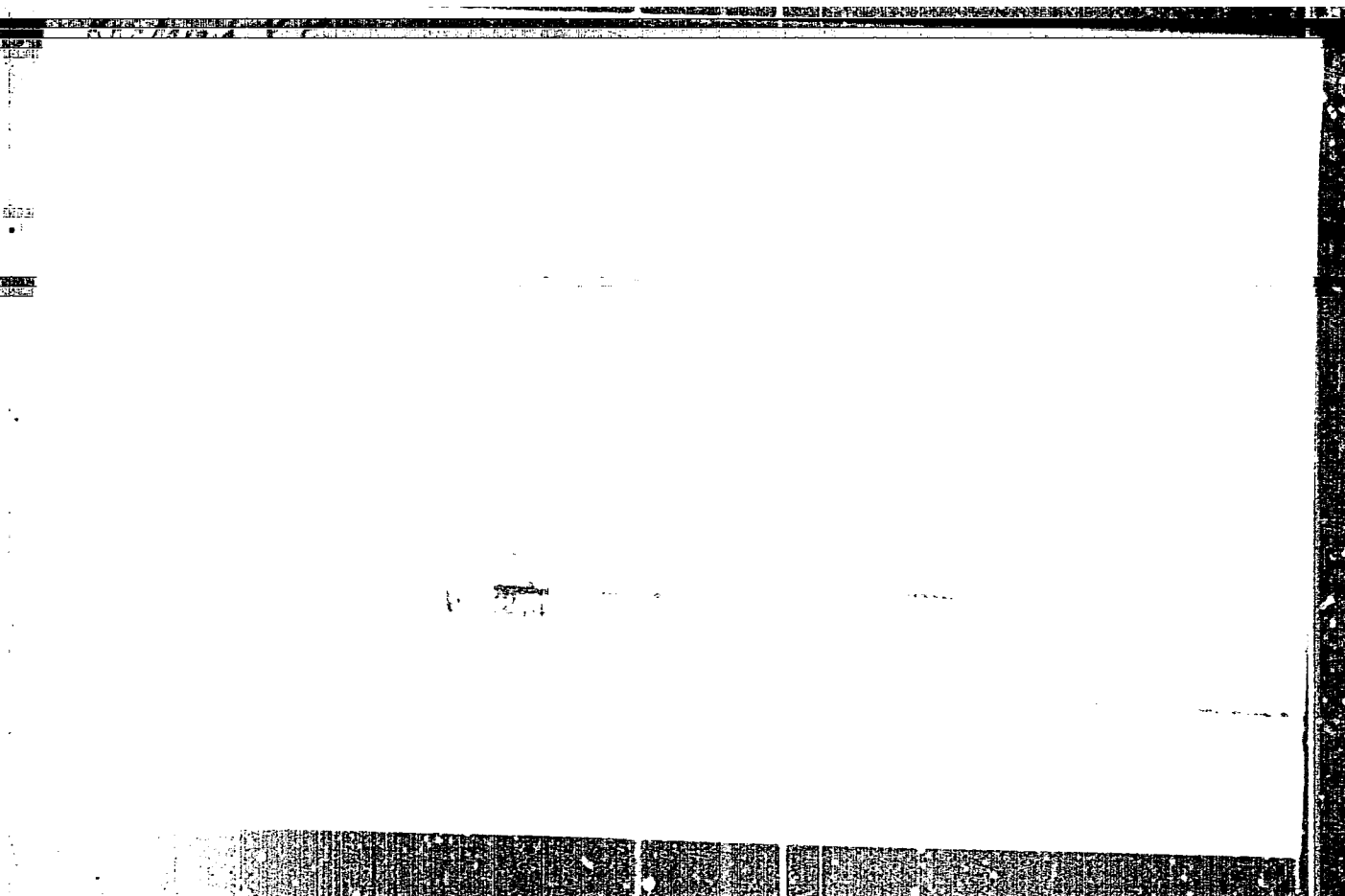
- 187 -

KOCHERGIN, I.P.; STOLYANOVA, O.I.

Diffusion of iron in fused mixtures of lithium and potassium,
and sodium and potassium. Zhur.prikl.khim. 29 no.5:730-733
My '56. (Iron) (Chlorides) (MLA 9:8)

"APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7



APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723510006-7"

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 12, p 128 (USSR) SOV/137-58-12-24908

AUTHORS: Kochergin, V. P., Nimvitskaya, T. A., Kruglov, A. N.

TITLE: Physicochemical Properties of Halide Electrolytes (Fiziko-khimicheskiye svoystva galogenidnykh elektrolitov)

PERIODICAL: Byul. nauchno-tekhn. inform. Ural'skiy nauch.-issled. inst. Chernykh metallov, 1957, Nr 3, pp 160-168

ABSTRACT: The composition of the electrolytes (in mole/liter) is SnCl_2 0.25 + NaF 0.9 + phenol 0.05 + HCl 3-4 g/liter + gelatin 1 g/liter (I), and SnCl_2 0.25 + NaF 0.9, HCl 3-4 g/liter + gelatin 1 g/liter, technical fraction from the distillation of coal tar 10 g/liter (II). The stability of solutions I and II in the process of electrolysis is satisfactory, the decrease in the concentration of F^- and free HCl which was observed is related to the precipitation of NaF and to complex hydrolysis reactions. This does not, however, bring about any decrease in the Sn content of the solution. Physicochemical properties of both solutions are adduced.

Card 1/1

V. S.

AUTHORS: Kochergin, V. P., Yarutina, K. P. SOV/156-58-2-15/48

TITLE: The Dissolution of Iron in Molten Sodium and Zinc Halides
(Rastvoreniye zheleza v rasplavlennykh galogenidakh natriya i tsinka)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 2, pp. 266 - 270 (USSR)

ABSTRACT: The dissolving of different metals in melted chlorides is influenced to a considerable extent by hydrogen ions. These ions can originate: a) by the hydrolysis of salts at high temperatures in the presence of traces of water (Ref 2); b) by the addition of small amounts of HCl to the cations involved. The stability of complex compounds in melted electrolytes depends not only on the nature of the central component of the complex, but also on the nature of the components of the ligand of the complex, as is known (Ref 4). In this paper the results of dissolving iron in the following melt pairs: ZnCl_2 - NaF, ZnCl_2 - NaBr, ZnCl_2 - NaJ, MgCl_2 - NaBr, and MgCl_2 - NaJ are explained. Since these compounds contain halide ions the formation

Card 1/4

The Dissolution of Iron in Molten Sodium and Zinc Halides

SOV/136-58-2-15/48

of complex ions is possible. These studies are also of practical interest, since they disclose other means using the chloride salt systems by which non-aggressive mixtures of halides can be found. The speed with which the iron was dissolved was made possible by a previously published method (Ref 13). The results determined from the melted salts with all water removed are given in figure 1. A few results from previous work (Ref 1) are also given. From these results it is apparent that the speed with which the iron dissolves in the systems used decreases in the course of time. It is slower in the magnesium systems than in the zinc systems. In both cases the speed of dissolving decreases in changing from NaCl to NaBr and to NaJ. These regular phenomena can be explained by the increased stability of the complex ions resulting when chloride ions are replaced by bromide, iodide, or fluoride ions in the complex; they can be explained also in terms of the increasing complex-forming tendency in the series Zn^{+2} - Mg^{+2} (Refs 1-5). The stability of the complex anions decreases with an increase in temperature, while the ions tend to become more symmetrical (Ref 14). An increase in the concentration of the sodium halides in the melt tends to

Card 2/4

The Dissolution of Iron in Molten Sodium and Zinc
Halides

SOV/156-58-2-15/48

make the anion complex more stable (Fig 3). Any moisture or foreign compounds were next removed from the melt with dry air. The solubility of the iron in this melt was about 300 times less. This refuted the assertions of several authors (Refs 16,17), who claimed that the tempering of metals is destroyed by the oxygen dissolved in the salt vats. Figure 4 shows the decrease in iron solubility in the melt series ZnCl_2 -NaCl and ZnCl_2 -NaBr and in the melts ZnCl_2 -NaCl and MgCl_2 -NaCl. The results show the dependence of the iron solubility in melted electrolytes upon the change of stability of the complex anions in the melts, which changes when the polarization characteristics of the central component or of the azido ligands are varied. The tendency of the melt components to hydrolyse and to form compounds with hydrogen ions also plays a role here (Ref 1). A practical result of the investigations is that one can reduce the solubility of iron by preparing appropriate melts of chloride and fluoride salts of different metals. A high vacuum causes a complete ligation of the iron solubility in the melts. There are 4 figures and 20 references, which are Soviet.

Card 3/4

The Dissolution of Iron in Molten Sodium and Zinc
Halides

SOV/156-58-2-15/48

ASSOCIATION: Kafedra neorganicheskoy khimii Ural'skogo gosudarstvennogo
universiteta im.A.M.Gor'kogo (Chair of Inorganic Chemistry of
the Ural State University imeni A.M.Gor'kiy)

SUBMITTED: October 26, 1957

Card 4/4

SOV/81-59-16-57713

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 16, p 293 (USSR)

AUTHORS: Kochergin, V.P., Loginova, M.

TITLE: The Removal of Tin From Tin Plate

PERIODICAL: Byul. nauchno-tekhn. inform. Ural'skiy n.-i. in-t chern. metallov, 1958, Nr 4, pp 97-102

ABSTRACT: The method consists in the chemical dissolution of Sn and its cathode precipitation. An electrolyte of the composition (in g/l): KOH 100, 3 - $C_6H_3(COOH)_2NO_2$ (3-nitrophthalic acid) 15, temperature 70°C, D_k 0.4 - 4 a/dm² is recommended. The cathodes are cold- or hot-rolled sheet iron; the anodes are sheet or stainless steel. The electrolyte is stirred at a rate of 100 rpm. The chemical dissolution of Sn is carried out in a separate tank with simultaneous circulation of the electrolyte between the tank for dissolution and the tank for electrolysis. It has been established that the rate of Sn dissolution is higher than in a solution of NaOH with the addition of metanitrobenzoic acid. In the case of the application of Sn-anodes the precipitation of sponge-like Sn precipitates took place.

Card 1/1

M.M.

5(2)

AUTHORS:

Kruglov, A. N., Kochergin, V. P.

SOV/156-59-1-17/54

TITLE:

On the Complex Compounds of the Ions of Bivalent Tin With Sodium and Potassium Fluoride (O kompleksnykh soyedineniyakh ionov dvukhvalentnogo olova s fluoridami natriya i kaliya)

PERIODICAL:

Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1959, Nr 1, pp 70 - 74 (USSR)

ABSTRACT:

The complex formation of bivalent tin in a sulfuric acid solution is known. In the present work halogen salt solutions of tin are investigated, especially in the presence of sodium or potassium fluoride. For crystallizing the solution the following substances were used: $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$, NaF , KF , HCl , distilled phenol and gelatin of the type "ch.d.a.". (In tinning phenol and gelatin are added as surface-active substances which promote the formation of dense tin covers). The solutions were investigated by the potentiometric method at various temperatures; moreover, the specific conductivity and the density of the solutions were measured. The conducti-

Card 1 / 2

On the Complex Compounds of the Ions of Bivalent Tin
With Sodium and Potassium Fluoride

SOV/156-59-1-17/54

vity minima found (Diagrams, Fig 2) are indicative of complex compounds the composition of which only depends on the HCl content of the solution but not on temperature and the phenol or gelatin content. The tin ions accumulate more F^- ions in the presence of KF than in the presence of NaF . The potentiometric investigation showed a great number of possible complex compounds, according to the concentration of hydrochloric acid. Since F^- ions have a considerable polarizing effect they form more stable complex anions than SO_4^{2-} ions. It may be expected that in tin-plate production H_2SO_4 solutions will be displaced by halogen salt solutions.

There are 4 figures, 2 tables, and 16 references, 12 of which are Soviet.

ASSOCIATION:

Kafedra neorganicheskoy khimii Ural'skogo gosudarstvennogo universiteta im. A. M. Gor'kogo (Chair of Inorganic Chemistry of Ural State University imeni A. M. Gor'kiy)
January 24, 1958

SUBMITTED:
Card 2/2

5(2), 13(7)

ABSTRACT:

Kochergin, V. P., Bogatyreva, N. Ye.

SV, 156-13-1-53/54

TITLE:

The Dissolution of Iron in Fusions Which Contain Lithium Chloride and Sulphates of Alkali- and Alkaline Earth Metals (Rastvereniye zheleza v rasplavakh, soderzhashchikh litii i sulfaty shchelochnykh i shchelochnozemel'nykh metallov)

PERIODICAL:

Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1959, Nr 1, pp 206 - 209 (USSR)

ABSTRACT:

An investigation is made into the corrosion of iron in non-dehydrated fusions of: $\text{LiCl} + \text{Na}_2\text{SO}_4$, $\text{LiCl} + \text{K}_2\text{SO}_4$, $\text{LiCl} + \text{CaSO}_4$, and $\text{LiCl} + \text{MgSO}_4$. The course of the solution process as a function of time and temperature is represented in diagrams. On the corrosion in chloride fusions (without sulphates) it was found that the dissolution of iron is connected with the occurrence of H^+ -ions:

$\text{Fe} + 2\text{H}^+ = \text{H}_2 + \text{Fe}^{2+}$. The H^+ -ions are formed in the fusions

Card 1/3

. The Dissolution of Iron in Fusions Which Contain Lithium Chloride and Sulphates of Alkali- and Alkaline Earth Metals SOV/156-99-1-53/54

by the hydrolysis of the salts in water traces. If a high vacuum is used, and if the residual water is removed beforehand, corrosion does not occur. In the presence of sulphates, however, it is not only the H^+ -ions that have a corrosive effect, but SO_4^{2-} -ions also appear in this process. The reaction $3Fe + SO_4^{2-} = Fe_3O_4 + S^{2-}$ was demonstrated by an x-ray investigation of the oxidation products. Here too, at any rate, the corrosion rate was reduced after the removal of the water traces and on treating a high vacuum. Contrary to the views of other authors on the oxidizing effect of atmospheric oxygen, the blowing of dry air through the fusions showed a lowering of the corrosion rate. Apparently air removes the water traces, whereas oxygen, due to its poor solubility, remains ineffective in the fusion. There are 4 figures and 12 references, 10 of which are Soviet.

Card 2/3

The Dissolution of Iron in Fusions Which Contain
Lithium Chloride and Sulphates of Alkali- and Alkaline Earth Metals

SCY/156-59-1-53/54

ASSOCIATION: Kafedra neorganicheskoy khimii Ural'skogo gosudarstvennogo
universiteta im. A. M. Ger'kova (Chair of Inorganic Chemistry
of Ural State University ineni A. M. Ger'kiy)

SUBMITTED: June 26, 1958

Card 3/3

AUTHORS: Kochergin, V.P., Prostakov, M.Ye. and Tarasova, A.A. SOV/133-59-3-19/32

TITLE: Electrochemical Degreasing of Cold-rolled Sheets
(Elektrokhimicheskoye obezshirivaniye kholodnokatanoy zhesti)

PERIODICAL: Stal', 1959, Nr 3, pp 252 - 254 (USSR)

ABSTRACT: The ability of emulsifying agents (sodium silicate, OP-7, OP-10, oleic acid and Petrov's reagent) for decreasing surface tension of a degreasing solution (containing: 10 g/litres NaOH, 23 g/litres Na₂CO₃ and 21 g/litres Na₃PO₄) at 70 - 90 °C was established. It was found that cathodic degreasing of sheets rolled with the application of aqueous emulsions of castor oil and emulsol should be carried out under the following optimum conditions: current density of 10-15 A/dm² (with palm oil emulsion - 25 A/dm²), temperature of the degreasing solution not lower than 80 °C. The duration of the process 1 - 3 sec. The concentrations of emulsifying agents in the degreasing solution are given in the text. There are 1 figure and 9 references, 7 of which are Soviet and 2 English.

Card1/2

Electrochemical Degreasing of Cold-rolled Sheets 27/103-59-3-19/32

ASSOCIATION: Ural'skiy nauchno-issledovatel'skiy institut
chernykh metallov (Urals Scientific Research
Institute for Ferrous Metals)

Card 2/2

5(2)

AUTHORS:

Kochergin, Y. P., Potapova, O. G.

SOV/153-2-3-19/29

TITLE:

The Dissolution of Iron in Molten Chlorides of Zinc, Cadmium, and the Alkali Metals

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2, Nr 3, pp 406-411 (USSR)

ABSTRACT:

In the introduction, papers on this problem are discussed in brief. In this connection investigations on the electrochemical series of various metals are described in detail by Delimarskiy. They are the basis of further investigations. In the present paper the mechanism of the dissolution (corrosion) of iron in molten electrolytes is explained. The rates of the dissolution of iron in salt melts $\text{ZnCl}_2\text{-KCl}$, $\text{ZnCl}_2\text{-NaCl}$, $\text{CdCl}_2\text{-KCl}$, and $\text{CdCl}_2\text{-NaCl}$ at 500° were investigated. The investigations are carried out in dehydrated and in non-dehydrated salt melts. A dry hydrochloric flow was passed through the melt at 500° for the dehydration. It was found that the dissolution of iron in the zinc-containing melts takes place by a displacement of the hydrogen ions, whereas in the melts with CdCl_2 hydrogen and

Card 1/3

SOV/153-2-3-19/29
 The Dissolution of Iron in Molten Chlorides of Zinc, Cadmium, and the Alkali Metals

metallic cadmium are separated. The rate of dissolution of iron may therefore be determined by measuring the separated amount of hydrogen after different periods. The rate of dissolution of iron increases in the following series: $\text{MgCl}_2\text{-KCl} < \text{ZnCl}_2\text{-KCl} < \text{ZnCl}_2\text{-NaCl} < \text{CdCl}_2\text{-KCl} < \text{CdCl}_2\text{-NaCl}$ in the dehydrated and in the non-dehydrated salt melts. The ability of complex formation of the corresponding cations is also reduced in the same series: $\text{Mg}^{2+} > \text{Zn}^{2+} > \text{Cd}^{2+}$ in accordance with the investigations by Lantratov, Alabyshv (Ref 8), and Delimarskiy (Ref 6). The dissolution of iron in molten chlorides therefore depends mainly on the intensity of the complex formation. Figure 2 shows the dependence of the rate of dissolution of iron in the non-dehydrated salt melts on temperature in the range from 500 to 700°. With increasing temperature the stability of the complex compounds decreases; at the same time the degree of hydrolysis of the salts increases and leads to an increase of the hydrogen ion concentration. As a result also the dissolu-

Card 2/3

SOV/153-2-3-19/29
The Dissolution of Iron in Molten Chlorides of Zinc, Cadmium, and the Alkali Metals

tion rate of iron in the melts investigated increases with rising temperature. Figure 3 shows the connection between the rate of dissolution of iron at 500° and the compositions of the melts. A table gives the pH values of the aqueous solutions of the salt melts investigated. The dehydrated melts have a lower pH value since traces of hydrogen chloride remain after dehydration. The authors found that at increased temperature no oxygen of the air is dissolved in the salt melts $\text{ZnCl}_2\text{-KCl}$ and $\text{ZnCl}_2\text{-NaCl}$. There are 4 figures, 1 table, and 15 references, 12 of which are Soviet.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni A. M. Gor'kogo
Kafedra neorganicheskoy khimii (Urals State University imeni A. M. Gor'kiy, Chair of Inorganic Chemistry)

SUBMITTED: March 10, 1958

Card 3/3

KOCHERGIN, V.P.; CHERDANTSEVA, N.N.; PLOTNIKOVA, N.I.

Solution of cold-rolled tin in fused chlorides of tin, zinc, and
alkali metals. *Izv.vys.ucheb.sav.; khim.i khim.tekh.* 2 no.5:
734-740 '59. (MIRA 13:6)

1. Ural'skiy gosudarstvennyy universitet, kafedra neorganicheskoy
khimii.

(Tin)

(Chlorides)

S/081/61/000/002/003/023
A005/A105

Translation from: Referativnyy zhurnal, Khimiya, 1961, No. 2, p. 283, # 21221

AUTHORS: Prostakov, M.Ye., Kochergin, V.P., Levin, A.I.

TITLE: The Investigation of Corrosion of Passivated Tin Plate

PERIODICAL: "Byul. nauchno-tekhn. inform. Ural'skiy n.-i. in-t Chern. metallov",
1959, No. 7, pp. 76 - 82

TEXT: The investigation of the corrosion rate of non-passivated, chemical-ly and electrochemically passivated tin plate showed that the passivation of tin plate increases its resistance to aggressive media; electrochemically passivated tin plate has a higher corrosion resistance than chemically passivated tin plate in 3% CH_3COOH , tomato sauce, NaCl , and animal fat. Chemically passivated tin plate is resistant under the conditions of action of fish preserves. It is established that the corrosion of tin plate in a gas medium totally depends on its coating porosity and is independent on the passivation method. ✓

From authors' summary

Translator's note: This is the full translation of the original Russian abstract.
Card 1/1

8/137/60/000/010/039/040
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 10, p. 309,
24918

AUTHORS: Kruglov, A.N., Kochergin, V.P.

TITLE: Metal Corrosion in Halide Solutions

PERIODICAL: Byul. nauchno-tekhn. inform. Ural'skiy n.-i. in-t chern. metallov,
1959, No. 7, pp. 83 - 85

TEXT: Results are given of corrosion tests made with 08kn (08kp), Cr.3
(St.3), 1X18H9 (1Kh18N9), 1X18H9T (1Kh18N9T), X13H4Г9 (Kh13N4O9),
1X17H3Г8A3 (1Kh17N3O8Az) steels, electrolytic Cu and vinyl plastics in halide
solutions, containing in g/liter: SnCl₂ 63; KP 55; NaF 34; HCl 2-3;
gelatin 1 and phenol 5. ✓

P.N.

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

8/081/61/000/003/005/019
A166/A129

AUTHORS: Prostakov, M. Ye., Kochergin, V. P., Shayevich, A. B.

TITLE: The composition of the surface layers of some metals and alloys after passivation in alkaline solutions of sodium chromate and bichromate

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 3, 1961, 290, abstract 31103.
(Byul. nauchno-tekhn. inform. Ural'skiy n.-i. in-t Chern. metallov, 1959, no. 7, 91 - 94)

TEXT: Spectral analysis was used to determine the Cr content in passive films on passivated tin plate and also on passivated samples of galvanized Fe, brass and Cu, coated with an Sn-Pb solder. Passive films on passivated tin plate proved to be durable in boiling water and partly durable in alkaline solutions. Complete destruction of these films was observed in a boiling solution containing NaCl (200 g/l) and HCl (acid) (4 g/l).

Author's summary

[Abstracter's note: Complete translation]

Card 1/1

KOCHERGIN, V.P.; PROSTAKOV, M.Ye.; NIMVITSKAYA, A.T.

Porosity of tin plate coating. Kons. i sv. prom. 14 no.11:22-27
N '59. (MIRA 13:2)

1.Ural'skiynauchno-issledovatel'skiy institut chernykh metallov.
(Tin cans--Corrosion)

5(2)

SOV/80-32-3-20/43

AUTHORS:

Kruglov, A.M., Kochergin, V.P.

TITLE:

Electrolytic Tinning of Metal Plates in Halide Solutions Containing Fluorides of Alkali and Alkali-Earth Metals (Elektroliticheskoye lusheriyе sheeti iz galgenidnykh rastvorov, soderhashchikh ftoridy shchelochnykh i shchelochnozemel'nykh metallov)

PERIODICAL:

Zhurnal prikladnoy khimii, 1959, Vol XXXII, Nr 3, pp 582-588 (USSR)

ABSTRACT:

The solubility of the fluorides of lithium, potassium, magnesium, calcium, strontium and barium in a solution of SnCl_2 (0.21 mole/l), HCl (3-4 g/l), and gelatine (1 g/l) is many times higher than in a 0.5 n solution of HCl . The addition of surface-active substances increases the cathode polarization during electric precipitation of tin. The fluorides may be arranged according to their effect in the following rising series: Mg , Ca , Sr , Ba , Li , Na , K . Organic cation additions, like leucotron B, have a higher effect on polarization than molecular additions, like phenol. The cathode precipitate of tin with a thickness of 1 - 1.5 μ at a current density of 20 - 40 a/dm^2

Card 1/2

SOV/80-32-3-20/43

Electrolytic Tinning of Metal Plates in Halide Solutions Containing Fluorides
of Alkali and Alkali-Earth Metals

and a temperature of 50°C forms a smooth surface. From halide solutions with additions of organic substances and in the presence of KP tin precipitates of a thickness of 3.5 μ are formed. There are 5 graphs, 1 table and 22 references, 19 of which are Soviet and 3 English.

SUBMITTED: September 13, 1957

Card 2/2

5.4600

S/153/60/003/02/24/034
B011/B006

AUTHORS: Kochergin, V. P., Beynis, Sh. I.

TITLE: Removal of Lead - Tin Plating on Lead-plated Iron

PERIODICAL: Investiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1960, Vol. 3, No. 2, pp. 337-340

TEXT: The method previously developed by V. P. Kochergin (Ref. 1) for removing the plating mentioned in the title requires the use of expensive KOH, and of m-nitro-benzoic acid, which reacts too slowly. In the present paper, the authors therefore apply NaOH in the presence of o-, m-, and p-nitro-phenol. The temperature of the solution was kept constant by a TS-15 thermostat. The lead - tin alloys contained 10 - 80% by weight of tin. The dissolution rate was determined by the methods given in Ref. 1. The dissolution rate of these alloys in NaOH- and o-nitro-phenol solutions at 70°C are shown in Fig. 1. For comparison, the isothermal lines of the dissolution rate of an alloy containing 11% Sn, according to Ref. 1, are given. From this it is evident that the dissolution rate in the latter case (Ref. 1) is only half

Card 1/3

X

Removal of Lead - Tin Plating on
Lead-plated Iron

8/153/60/003/02/24/034
B011/B006

of that measured in NaOH - nitrophenol solution. Formation of insoluble gel-like Sn-Pb compounds, which was observed in m-nitro-benzoic acid, does not occur in the presence of o-nitro-phenol. The dissolution rate of the above alloys increase with an increase in o-nitro-phenol concentration (up to 20 g/l), a rise in temperature (up to 70°C), and a reduction of the tin content in the alloy. An alloy containing about 60% by weight of Pb dissolves most slowly. Metallic lead is deposited from saturated solutions containing a Sn:Pb ratio of between 1:6 and 1:3. At ratios of less than 1:2, Sn and Pb were deposited together. From a solution containing about 13.3 g/l Sn and 0.75 g/l Pb, only metallic tin is deposited. The results obtained by this investigation were tested using samples of lead-plated iron (containing up to 15 - 15% Sn in the plating). Plating was entirely removed in all cases and deposited at the cathode by the method described in the present paper. The removal of the above-mentioned platings can be carried out with maximum cathodic current densities of 3 a/dm² at a temperature of 70°C, and with bubbling a continuous stream of air through the solution. There are 5 figures, and 7 Soviet references. X

Card 2/3

Removal of Lead - Tin Plating on
Lead-plated Iron

8/153/60/003/02/24/034
B011/B006

ASSOCIATION: Ural'skiy gosudarstvennyy universitet im. A. M. Gor'kogo;
Kafedra neorganicheskoy khimii (Ural State University
imeni A. M. Gor'kiy; Chair of inorganic Chemistry)

SUBMITTED: July 23, 1958

XX

Card 3/3

9/153/60/003/005/009/016
B013/B058

AUTHORS: Kochergin, V. P., Poshidayeva, G. A., Startseva, N. A.

TITLE: Dissolution of Iron in Melts Containing Zinc Sulfate and Halides of Alkali Metals and Zinc

PERIODICAL: *Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya*, 1960, Vol. 3, No. 5, pp.892-897

TEXT: The rate of dissolution (corrosion) of iron in aqueous $ZnSO_4$ - $ZnCl_2$, $ZnSO_4$ -LiCl, and $ZnSO_4$ -KCl solutions, as well as in $ZnSO_4$ -NaF-, $ZnSO_4$ -NaCl-, $ZnSO_4$ -NaBr-. and $ZnSO_4$ -NaI melts, was studied here. It was the aim of the study to investigate the possibility of using sulfate halide melts for the heat treatment of steels, and to find possible bases for producing new salt melts which are less aggressive against iron and steels. Chemically pure $ZnSO_4 \cdot 7H_2O$, LiCl $\cdot H_2O$, KCl, NaCl, $ZnCl_2 \cdot 1.5H_2O$, NaI, NaBr, NaF were used for producing the melts mentioned. Melts with NaBr and NaI content were produced in carbon dioxide medium. Metal samples were prepared

Card 1/4

Dissolution of Iron in Melts Containing Zinc S/153/60/003/005/009/016
Sulfate and Halides of Alkali Metals and Zinc B013/B058

in the form of plates, and polished. The determination was made by the method described in Ref. 9. The rate of dissolution of iron in aqueous solutions was determined at 550°C (Fig. 1) and in melts at 500°C (Fig. 2). It was established that the rate of dissolution decreases during the first 2-3 hours, and then remains constant. By adding $ZnCl_2$ -LiCl-KCl to the

$ZnSO_4$ melt, the dissolution of iron is slowed down much more than by adding NaF, NaCl, NaBr, NaI. In melts containing zinc- and alkali metal halides, an increased solubility of iron may be observed in the absence of zinc sulfate. When increasing the zinc sulfate content up to 45% (Fig. 3), accelerated dissolution of iron was first observed in sulfate halide melts, which slowed down, however, with a further increase of the zinc sulfate concentration. It can be clearly seen from the polytherms for the rate of dissolution (Fig. 3) of iron in sulfate halide melts that the dissolution process is influenced by the nature of these melts and the complex formation within them. A similar effect was observed at different temperatures of the melts (Fig. 4). It was established that the dissolution of iron in aqueous sulfate halide melts is accelerated at a temperature increase according to an exponential function. A lower solubility of iron

Card 2/4

Dissolution of Iron in Melts Containing Zinc Sulfate and Halides of Alkali Metals and Zinc 3/153/60/003/005/009/016
B013/B058

was established in melts from which the water was previously extracted in vacuo, as compared with aqueous melts. The rate of dissolution of iron is higher in $\text{ZnSO}_4\text{-NaF}$ and $\text{ZnSO}_4\text{-NaI}$ melts than in melts with zinc sulfate, sodium chloride, or sodium bromide. Passage of dry air through aqueous melts with zinc sulfate as well as zinc-, sodium-, and potassium chlorides contributes to the slowing down of the rate of dissolution of iron in these melts (Fig. 5). In order to prevent corrosion of metal products in molten electrolytes, it is, therefore, suitable to treat them with dry air at increased temperature or in high vacuum. Since the rate of dissolution of iron is only small in sulfate chloride melts with a zinc content of more than 70-80 mole%, these melts may be used as heat carriers (Ref. 16) or for the heat treatment of steels. I. P. Afonskiy, A. A. Kroshkin, I. Ya. Tutov, Ye. A. Smol'nikov, and N. P. Luzhnaya are mentioned. There are 5 figures and 16 references: 12 Soviet, 1 German, and 1 US.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet im. A. M. Gor'kogo, Kafedra neorganicheskoy khimii (Ural State University imeni A. M. Gor'kiy, Department of Inorganic Chemistry)

Card 3/4

Dissolution of Iron in Melts Containing Zinc
Sulfate and Halides of Alkali Metals and Zinc

S/153/60/003/005/009/016
B013/B038

SUBMITTED: December 15, 1958

Card 4/4

S/148/60/000/010/013/018
A161/A030

AUTHORS: Kochergin, V.P.; Savel'yev, V.N.; Asanova, E.P.

TITLE: Corrosion of Iron in Melts Containing Nitrates of Lithium, Sodium, Potassium and Barium

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, 1960, No. 10, pp. 132 - 138

TEXT: Only a few and contradictory data are available on corrosion of metals in molten nitrates used for heat treatment. The iron corrosion process and the chemical reactions in the thermal decomposition of nitrates have been studied by the Ural State University. The results are given and illustrated by diagrams. Armco iron plates were used for iron specimens; the corrosion rate was determined by weight; porcelain crucibles with nitrate melts were held in a shaft furnace with a contact thermostat. The iron content in melts was determined by bichromatometric analysis. The thermal decomposition of nitrates and their mixtures was studied under the same conditions in air, and in a deep vacuum. The corrosion rate increased in nitrates in the sequence NaNO_3 - KNO_3 - LiNO_3 , and their equimolecular mixtures in the sequence NaNO_3 - $\text{Ba}(\text{NO}_3)_2$, NaNO_3 - KNO_3 , NaNO_3 - LiNO_3 . ✓

Card 1/6

S/148/60/000/010/013/018
A161/A030

Corrosion of Iron in Melts Containing Nitrates of Lithium, Sodium, Potassium and Barium

The corrosion product in molten nitrates was stated to be Fe_3O_4 . The high corrosion rate in undehydrated $LiNO_3$ is explained by the reaction of iron with molecular oxygen from decomposing lithium nitrate and with nitrogen oxides. Mixed nitrates caused more intense corrosion than single nitrates (Fig. 2), which is due to the mutual effect of cations on the stability of NO_3 ions. Corrosion dropped to a minimum after 2 - 3 hours at 500° in all melts except for KNO_3 , and increased again (Fig. 3) (the phenomenon had been observed previously [Ref. 16]). The outer appearance of iron specimens indicated this process, too: the firm black oxide film formed in one hour turned into loose and rough film after six hours. An increased corrosion rate by faster diffusion of the oxidizing agent on the surface of iron was observed at 500° when specimens were rotated with 60 rpm for 2 hours in $NaNO_3$. The corrosion rate with rotation was $0.0014 \text{ g/cm}^2 - \text{hour}$ compared with $0.0003 \text{ g/cm}^2 - \text{hour}$ on a stationary specimen. Low corrosion was stated in $NaNO_3 - Ba(NO_3)_2$ (50%), $NaNO_3$, and in preliminarily vacuum-treated $NaNO_3 - LiNO_3$ (20%), and these compounds are recommended for heat carriers and hardening melts. Vacuum treatment had not the same effect on all nitrates - the iron corrosion rate noticeably dropped in $NaNO_3 - LiNO_3$ (20%), but increased in

Card 2/6

S/148/60/000/010/013/018
A161/A030

Corrosion of Iron in Melts Containing Nitrates of Lithium, Sodium, Potassium and Barium

vacuum-treated NaNO_3 , and remained unchanged in vacuum-treated KNO_3 . It is concluded that the rate of iron corrosion in molten nitrates of alkaline metals rises with the accumulation of sodium nitrates and particularly of potassium nitrates in the melt. There are 5 figures and 18 references: 13 Soviet and 5 English.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet (Ural State University)

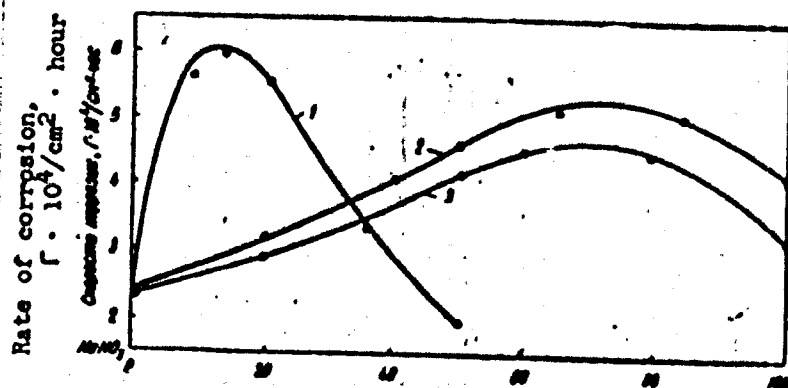
SUBMITTED: September 26, 1959

Card 3/6

S/148/60/000/010/013/018
A161/A030

Corrosion of Iron in Melts Containing Nitrates of Lithium, Sodium, Potassium and Barium

Figure 2: Corrosion of iron at 500°: 1 - in NaNO_3 - $\text{Ba}(\text{NO}_3)_2$; 2 - in NaNO_3 - LiNO_3 ; 3 - in NaNO_3 - KNO_3 . (Contents in molar %).



Card 4/6

S/148/60/000/010/013/018
A161/A030

Corrosion of Iron in Melts Containing Nitrates of Lithium, Sodium, Potassium and Barium

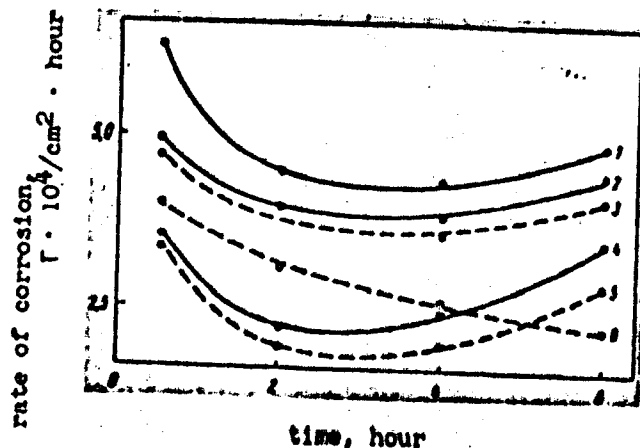


Figure 3: Corrosion during 6 h at 500°:

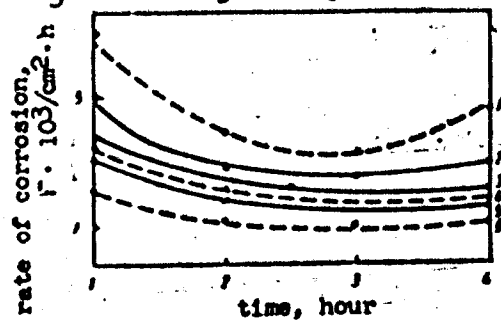
- 1 - in $\text{LiNO}_3 - \text{NaNO}_3$;
- 2 - in $\text{KNO}_3 - \text{NaNO}_3$;
- 3 - in LiNO_3 ;
- 4 - in $\text{Ba}(\text{NO}_3)_2 - \text{NaNO}_3$ (50% mol);
- 5 - in NaNO_3 ;
- 6 - in KNO_3 .

Card 5/6

S/148/60/000/010/013/018
A161/A030

Corrosion of Iron in Melts Containing Nitrates of Lithium, Sodium, Potassium and Barium

Figure 4: Corrosion at 500°: 2 - in $\text{LiNO}_3 - \text{NaNO}_3$ (80% mol); 3 - NaNO_3 ; 5 - KNO_3 ; and in deep vacuum treated melts 1 - NaNO_3 ; 4 - KNO_3 ; 6 - $\text{LiNO}_3 - \text{NaNO}_3$ (80% mol).



Card 6/6

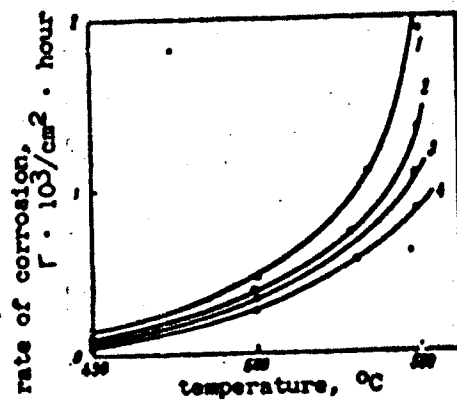


Figure 5: Corrosion at various temperatures (450 - 550°C).

82668

3/080/60/033/007/012/020
A003/A001

18.8300; 18.7100

AUTHORS: Kochergin, V. P., Druzhinina, Ye. P., Men'shenina, O. V.,
Asanova, E. P.

TITLE: The Corrosion of Iron in Molten Nitrates and Chlorides of Metals
of Groups I and II in D. I. Mendeleev's System

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol. 33, No. 7, pp. 1580-1586

TEXT: 1 The corrosion rate of iron was studied in the following melts:
 $\text{NaNO}_3 - \text{MgCl}_2$, $\text{NaNO}_3 - \text{ZnCl}_2$, $\text{NaNO}_3 - \text{LiCl}$, $\text{NaNO}_3 - \text{KCl}$, $\text{Ca(NO}_3)_2 - \text{NaCl}$,
 $\text{Sr(NO}_3)_2 - \text{NaCl}$, $\text{Ba(NO}_3)_2 - \text{NaCl}$, $\text{KNO}_3 - \text{NaCl}$. The degree of thermal decompo-
 sition of these nitrates in the presence of chlorides of various metals was
 also investigated. The results are important for selecting salt melts for
 fluxes, heat carriers and thermal treatment of metal articles. The experiments
 were carried out at a temperature of 500°C . The highest corrosion rate of iron
 was observed in the melt $\text{Ca(NO}_3)_2 - \text{NaCl}$. The oxidation decreases in the
 series of the following melts: $\text{Sr(NO}_3)_2 - \text{NaCl}$, $\text{Ba(NO}_3)_2 - \text{NaCl}$, $\text{KNO}_3 - \text{NaCl}$.
 The corrosion is accompanied by the reactions $2\text{Fe} + \text{O}_2 \rightarrow 2\text{FeO}$; $6\text{FeO} + \text{O}_2 \rightarrow 2\text{Fe}_3\text{O}_4$.

Card 1/3

S/OB0/60/033/007/012/020
A003/A001

The Corrosion of Iron in Molten Nitrates and Chlorides of Metals of Groups I and II in D. I. Mendeleev's System

Molecular oxygen appears in the melts due to thermal decomposition of nitrates to nitrites. The degree of nitrate decomposition depends on the counter-polarizing capacity of the cations. In the cation series Ca^{+2} - Sr^{+2} - Ba^{+2} - K^{+1} the counter-polarizing capacity decreases due to an increase in the radius and a decrease of the charge, the thermal stability of alkali earth metal nitrates increases, and the amount of molecular oxygen liberated decreases. The hydrolysis and thermal dissociation of the nitrates to metal oxides increases in proportion to an increase in the temperature and in the counter-polarizing capacity of the cations in the series: $\text{Ba}(\text{NO}_3)_2$ - NaCl , $\text{Sr}(\text{NO}_3)_2$ - NaCl , $\text{Ca}(\text{NO}_3)_2$ - NaCl . The corrosion rate increases if sodium nitrate is added to molten chlorides of magnesium, zinc, lithium and potassium. Beyond a certain maximum of the nitrate content the corrosion rate decreases again. It is evident that the chlorine ions are depassivators in the oxidation of iron in molten nitrates. They destroy the oxide film on the iron and facilitate the diffusion of the oxidizing agent to the surface of the metal. The dehydration of the melts in a deep vacuum at 500 °C for 2.5-3 hours leads to a considerable decrease of the corrosion rate in the melts: NaNO_3 - MgCl_2 , NaNO_3 - ZnCl_2 , NaNO_3 - LiCl , $\text{Sr}(\text{NO}_3)_2$ - NaCl .

Card 2/3

62-68

S/080/60/033/007/012/020
A003/A001

The Corrosion of Iron in Molten Nitrates and Chlorides of Metals of Groups I and II in D. I. Mendeleev's System

The decrease is caused by the elimination of gaseous hydrolysis products and traces of water. The conclusion is drawn that in the thermal treatment of metal articles, it is necessary to avoid the introduction of chlorides of various metals into saltpeter baths and the introduction of nitrates and nitrites of alkali and alkali earth metals into chloride baths. There are 4 graphs, and 17 references: 15 Soviet and 2 English. CX

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni A. M. Gor'kogo
(Ural State University imeni A. M. Gor'kiy)

SUBMITTED: December 14, 1959

Card 3/3

LEVIN, A. I.; PROSTAKOV, M.Ye.; KOCHEROV, V.P.

Thickness of passive films on tin and their protective action.
Zhur. prikl. khim. 33 no.9:2102-2108 8 '60. (MIRA 13:10)

1. Ural'skiy politekhnicheskiy institut im. Kirova i Ural'skiy
nauchno-issledovatel'skiy institut chernykh metallov.
(Films (Chemistry)) (Tin) (Passivation)

LEVIN, A.I.; PROSTAKOV, M.Ye.; KOCHERGIN, V.P. (SVERDLOVSK)

Anodic passivation of tin plate in sodium hydroxide solutions.
Zhur.fis.khim. 34 no.5:1117-1120 My '60. (MIRA 13:7)

1. Ural'skiy institut metallov i Ural'skiy politekhnicheskii
institut im. S.M.Kirova, Sverdlovsk.
(Tin plate) (Passivation)

18.8300 2800, 4016, 1530

27391
S/153/61/004/003/001/008
E071/E435

AUTHORS: Kochergin, V.P. and Popova, N.N.

TITLE: The influence of halogen ions on the corrosion of iron
in molten electrolytesPERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i
khimicheskaya tekhnologiya, Vol.4, No.3, 1961,
pp.397-403TEXT: In view of the lack of published data on the influence of
halogen ions on the corrosion of metals in molten electrolytes at
high temperatures, the authors carried out the determination of the
mean velocity of the corrosion of iron in melts of:

MgCl₂-NaH, ZnCl₂-NaH, ZnSO₄-NaH, Na₂CO₃-NaH, where
H = F⁻, Cl⁻, Br⁻ and I⁻. Chemically pure NaF, NaCl, NaBr, NaI,
MgCl₂·6H₂O, NaNO₃, ZnCl₂·1.5H₂O, ZnSO₄·5H₂O and NaCO₃ were used
for the preparation of melts. Melts containing sodium bromide or
iodide were prepared in a carbon dioxide atmosphere.

MgCl₂·6H₂O was dehydrated with dry hydrogen chloride or ammonium
chloride. The velocity of corrosion of iron was determined by the
previously described method (Ref.11: Zh. prikl. khimii, 27, 945,
(1954)) at 500°C on at least 3 specimens of armco iron in the form
Card 1/4

X

27391

S/153/61/004/003/001/008

E071/E435

The influence of halogen ions ...

of polished plates. It was found that the velocity of corrosion of iron in melts decreases in the following order: MgCl_2 -NaCl, MgCl_2 -NaBr, MgCl_2 -NaI as well as in ZnCl_2 -NaCl, ZnCl_2 -NaBr, ZnCl_2 -NaI, ZnCl_2 -NaF. A similar phenomenon takes place in the series of melts ZnSO_4 -NaF, ZnSO_4 -NaCl, ZnSO_4 -NaBr and ZnSO_4 -NaI. The process of corrosion of iron in melts ZnSO_4 -NaH is more complex than in the abovementioned electrolytes. Chemical and X-ray analysis of the corrosion products indicated that two parallel reactions are taking place.



Reaction (2) takes place at a high content of zinc sulphate and reaction (1) at a low one. After a vacuo treatment of the melt at 500°C for 3 hours, which removed compounds containing hydrogen ions, the corrosion of iron took place only by reaction (2). The influence of halogen ions on the decrease in the velocity of corrosion in the above series is explained by the formation of complex ions more resistant to hydrolysis (i.e. to the formation of

Card 2/4

27391

S/153/61/004/003/001/008

E071/E435

The influence of halogen ions ...

hydrogen ions) or in the case of $ZnSO_4$ (reaction (2)) due to a decrease in the oxidizing activity of SO_4^{2-} ions with increasing strength in complex ions. Other conditions remaining equal, the velocity of the corrosion of iron in melts $NaNO_3 - NaH$ decreases in the following order: $NaNO_3 - NaF$, $NaNO_3 - NaCl$, $NaNO_3 - NaBr$ and $NaNO_3 - NaI$. With an increasing proportion of sodium halogenide in molten sodium nitrate (up to 10 to 15 mole %) the velocity of corrosion increases; on further addition, it decreases.

A similar phenomenon was observed on the corrosion of iron in molten sodium carbonate in the presence of sodium halogenides at $800^\circ C$, but in this case the velocity of corrosion decreases in the following order: $Na_2CO_3 - NaI$, $Na_2CO_3 - NaBr$, $Na_2CO_3 - NaCl$ and $Na_2CO_3 - NaF$. The work of G.V.Akimov, N.D.Tomashov, V.N.Modestova, B.N.Kabanov, L.Vanyukova, A.Stromberg and T.Chukina is mentioned. There are 5 figures and 25 references: 22 Soviet and 3 non-Soviet. The three references to English language publications read as follows:

Ref.3: G.W.Mellor, M.Cohen, A.Beck, J. Electrochem. Soc., 105, 332 (1958); Ref.17: C.Gill, M.Straumanic, J.Electrochem. Soc., Card 3/4

27391

S/153/61/004/003/001/008
E071/E435

The influence of halogen ions ...

102, 42 (1956); Ref.24: P.Gloyd, E.Chamberlain, J.Iron and Steel
Inst., 142, 141 (1940). R.Box, B.Middleton, J.Iron and Steel
Inst., 151, 71 (1945).

ASSOCIATION: Ural'skiy gosudarstvennyy universitet im. A.M.Gor'kogo
Kafedra neorganicheskoy khimii (Ural State University
imeni A.M.Gor'kiy, Department of Inorganic Chemistry)

SUBMITTED: August 27, 1959

Card 4/4

18.8300

26285
S/078/61/006/009/005/010
B107/B101

AUTHORS: Kochergin, V. P., Ignat'yeva, N. I.

TITLE: Oxidation of iron in melts containing sodium halogenides and sodium carbonate

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 9, 1961, 2126 - 2131

TEXT: The rate of oxidation of Armco iron in mixtures of sodium carbonate with NaF, NaCl, NaBr and NaI between 700 and 900°C was investigated. The degree of thermal dissociation of Na_2CO_3 in such melts at 800°C and the emf of a galvanic cell iron - melt - platinum were also determined. The investigation of the rate of oxidation of iron is of interest in order to clarify the nature of the adhesive forces between enamels and the metallic surface. Fig. 1 shows the change of the rate of oxidation at 700°C in Na_2CO_3 - NaX (X - F, Cl, Br, I) melts with 50 mole% Na_2CO_3 . The aggressiveness drops in the order NaI, NaBr, NaF, NaCl. This is based on the differently strong depassivating effect of the halide ions. It was roentgenographically established that wüstite and magnetite form as reaction products in melts with

Card 1/6

26285

S/078/61/006/003/005/010

B107/B101

Oxidation of iron in melts containing ...

NaF and NaCl, and wüstite alone in melts with NaBr and NaI. The oxidation proceeds according to the equation $\text{Fe} + \text{CO}_2 = \text{FeO} \text{ (or } \text{Fe}_3\text{O}_4) + \text{CO} \text{ (1)}$. The oxidation products form a coat on the iron which has, however, a porous structure and does not prevent further oxidation. Only a small part of the iron dissolves as sodium ferrite. The degree of dissociation of Na_2CO_3 in the melts of the composition mentioned was determined at 800°C (Fig. 2). Here, too, the order NaBr, NaF, NaCl corresponds to a decreasing degree of dissociation. No trivalent iron forms in the melts with NaBr and NaI during oxidation of the iron, probably because the Fe_3O_4 from $E_q \text{ (1)}$ is reduced by the halide to FeO. The Br_2 or I_2 thus formed has a strong oxidizing effect on the iron; the more aggressive effect of the bromide and iodide, especially with access of air, is explained in this way (Fig. 1, isotherm 1). The rate of oxidation in melts with various halide concentration (800°C , 1 hr) was also investigated. As shown in Fig. 4, there is a strong concentration dependence, i.e., maximum aggressiveness exists for certain concentrations. The emf of the galvanic cell iron - melt - platinum at 800°C was finally determined. The melt consisted of $\text{Na}_2\text{CO}_3 - \text{NaX}$ (X - F, Cl, Br) in the molar

Card 2/6

Oxidation of iron in melts containing ...

26285
S/078/61/006/009/005/010
B107/B101

ratio 1 : 1. Fig. 6 shows the change of the emf with time. It is stated in conclusion that a Na_2CO_3 - NaCl melt with 30 - 50% NaCl is least aggressive.

G. V. Akimov (Osnovy ucheniya o korrozii i zashchite metallov, Metallurgizdat, 1941); N. D. Tomashov, V. I. Modestova (Tr. In-ta fiz. khimii AN SSSR, 5, 75 (1958)); B. N. Kabanov et al. (Dokl. AN SSSR, 59, 917 (1948); Zh. fiz. khimii, 31, 2501 (1957)); Z. A. Ioffa (Zh. fiz. khimii, 13, 1105 (1939)) and O. A. Yasin et al. (Fizicheskaya khimiya pirometallurgicheskikh protsessov, Metallurgizdat, 1950) are mentioned. There are 6 figures and 23 references: 19 Soviet and 7 non-Soviet. The four most recent references to English-language publications read as follows: O. Balestra, Metall Progress, 1, 1957; F. Bacon, I. Forrest, The Engineer, 202, 93 (1956); F. Bacon, J. Beama, 61, 6 (1954); M. E. Straumanis, A. W. Schlechten, J. Electrochem. Soc., 102, 131 (1955).

ASSOCIATION: Ural'skiy gosudarstvennyy universitet im. A. M. Gor'kogo
(Ural State University imeni A. M. Gor'kiy)

SUBMITTED: July 19, 1960

Card 3/6

18 8300

²¹⁰⁰¹
S/080/61/034/006/006/020
D247/D305

AUTHORS: Kochergin, V.P., Bormotova, L.V., Pryakhina, K.M., and
Asanova, E.P.

TITLE: Corrosion of iron in fused chlorides and carbonates of
alkali and alkaline-earth metals

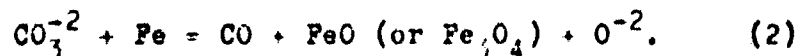
PERIODICAL: Zhurnal prikladnoy khimii, v. 34, no. 6, 1961,
1258 - 1266

TEXT: The literature on this subject is considered to be inconclu-
sive, some workers holding that alkali metal carbonates at high
temperatures do not react with iron, others such as N.D. Tomashov
and N.I. Tugarinov (ref. 2: ZhPKh, 1957, vol. 30, p. 1619) taking
the opposite view, assuming the carbonates to be depolarizers dur-
ing dissolution of iron in fused chlorides. Results are reported
of determinations of iron corrosion rates in melts of Li_2CO_3 - NaCl ,
 Na_2CO_3 - NaCl , K_2CO_3 - NaCl , BaCO_3 - NaCl , Na_2CO_3 - LiCl , Na_2CO_3 - KCl ,
 Na_2CO_3 - CaCl_2 , and Na_2CO_3 - BaCl_2 . Chemically pure salts were used to
Card 1/6

24001
S/080/61/034/006/006/020
D247/D305

Corrosion of iron in ...

prepared the melts in crucibles of alundum, platinum or zirconia. The iron specimens were carefully polished Armco plates. Corrosion rate in melts was gravimetrically determined after 1 hour's soaking at the experimental temperature, using 3 to 6 specimens in each case. Iron corrosion rates are shown. X-ray analysis showed the corrosion products to be basically iron oxides. It was also shown that the degree of dissociation of the carbonates is maximum for Li_2CO_3 , minimum for Na_2CO_3 , with K_2CO_3 intermediate. The rate of Fe oxidation in these salt melts shows the same order (for melts with NaCl in each case). The reaction in this case is: $\text{Fe} + \text{CO}_2 = \text{FeO}$ (or Fe_3O_4) + CO. Combustion of the CO formed was visible. In the melt of $\text{Na}_2\text{CO}_3\text{-KCl}$ (50 %), the CO_3 ions are less strongly bonded to the K ions than to the Na ions owing to the difference in ionic radii and the reaction takes place according to the equation:



The oxides of the alkali metals formed partially combine with iron oxide in the melts to give ferrites. This process, like the first

Card 2/6

24004

S/080/61/034/006/006/020

D247/D305

Corrosion of iron in ...

reaction, is more probable at elevated temperatures. Iron corrosion rate determination results are shown for melts of $\text{Na}_2\text{CO}_3\text{-NaCl}$, $\text{Li}_2\text{CO}_3\text{-NaCl}$, $\text{K}_2\text{CO}_3\text{-NaCl}$, $\text{BaCO}_3\text{-NaCl}$, $\text{Na}_2\text{CO}_3\text{-KCl}$, $\text{Na}_2\text{CO}_3\text{-LiCl}$ (chloride content 50 %) and $\text{Na}_2\text{CO}_3\text{-CaCl}_2$ (75 %) and $\text{Na}_2\text{CO}_3\text{-BaCl}_2$ (75 %), for temperatures of 700 - 900°C. General increases of the Fe corrosion rate with temperature are given. The rate in $\text{K}_2\text{CO}_3\text{-NaCl}$ at 800-900°C is somewhat higher than in $\text{Li}_2\text{CO}_3\text{-NaCl}$, but this is reversed at 700°C. It is concluded that the depolarizing and oxidizing activity of CO_3^{2-} ions in the melt, and of the products of their thermal decomposition, is a maximum with the same ratio of carbonates to chlorides of various metals. A displacement of the maximum of the iron oxidation isotherm in $\text{Li}_2\text{CO}_3\text{-NaCl}$ melts in the range of high Li_2CO_3 content (60 %) is apparently due to increased thermal dissociation of Li_2CO_3 at 800°C to form a large amount of CO_2 to interact with Fe. In some of these melts, Fe oxidation was reduced by formation of a dense oxide layer on the metal. The processes occurring at the melt-metal interface were studied by determining the e.m.f. in the $\text{Fe}^0\text{/Melt/Pt}^0$ system. Deter-

Card 3/6

Corrosion of iron in ...

2400h
S/080/61/034/006/006/020
D247/D305

minations were made in an N_2 atmosphere at $750^\circ C$ in a quartz tube provided with a special device for introducing the metal specimen into the melt. The e.m.f. was measured with a potentiometer (PPTV-1). Results for melts of K_2CO_3-NaCl , Na_2CO_3-NaCl , Li_2CO_3-NaCl (containing 50 % $NaCl$), $BaCO_3-NaCl$ (56 %), Na_2CO_3-KCl (50 %), Na_2CO_3-LiCl (50 %), $Na_2CO_3-CaCl_2$ (25 %) and $Na_2CO_3-BaCl_2$ (25 %) are shown in Fig. 6. It is generally concluded that on increasing the alkali- or alkaline-earth carbonate content of the melts studied, iron corrosion rate increases to a maximum and then decreases. The degree of thermal dissociation of carbonates of Li, K or Na is reduced by addition of 50 % $NaCl$ at $800^\circ C$ and the same is true of $NaCl$ to which chlorides of Ca, Ba, Sr, K or Na are added. The e.m.f. of a $Fe^-/melt/Pt^+$ galvanic cell in these melts at $750^\circ C$ is a maximum with K_2CO_3-NaCl and a minimum with Li_2CO_3-NaCl (each with 50 % $NaCl$). There are 6 figures and 31 references: 15 Soviet-bloc and 16 non-Soviet-bloc. The four most recent references to the English-language publications read as follows: D.D. Williams, J.A. Grand, and R.R. Miller, J. Am. Chem. Soc., 78, 1956; O. Bales-

Card 4/6

Corrosion of iron in ...

21004
S/080/61/034/006/006/020
D247/D305

tra, Metal Progress, 1, 1957; P. Bacon, J.S. Forrest, The Eng.,
202, 93, 1956; M.E. Straumanis, and A.W. Schlechten, J. Electroch.
Soc., 102, 131, 1955.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni A.M.
Gor'kogo (Ural State University, imeni A.M. Gor'kiy)

SUBMITTED: July 8, 1960

Card 5/6

Corrosion of iron in ...

21.004
S/080/61/034/006/006/020
D247/D305

Fig. 6. E.m.f. of Pt/melt/Fe cell with the various melts.

Legend: A - e.m.f. value (volts);
B - time (min). Melts at 800°C. -
1. K_2CO_3-NaCl ; 2. Na_2CO_3-NaCl ;
3. Na_2CO_3-KCl ; 4. $Na_2CO_3-CaCl_2$;
5. $Na_2CO_3-BaCl_2$; 6. Na_2CO_3-LiCl ;
7. $BaCO_3-NaCl$; 8. Li_2CO_3-NaCl .

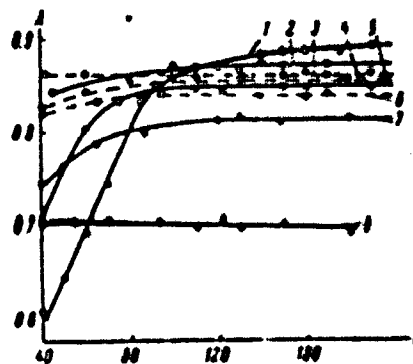


Рис. 6. Эдс ячейки Pt-сплав/Fe в различных расплавах.

A - эдс (В), B - время (мин).
Расплавы при 800°C: 1 - K_2CO_3-NaCl , 2 -
 Na_2CO_3-NaCl , 3 - Na_2CO_3-KCl , 4 - $Na_2CO_3-CaCl_2$,
5 - $Na_2CO_3-BaCl_2$, 6 - Na_2CO_3-LiCl , 7 -
 $BaCO_3-NaCl$, 8 - Li_2CO_3-NaCl .

Card 6/6

PROSTAKOV, M.Ye.; LEVIN, A.I.; KOCHEROV, Y.P.

Anodic behavior of zinc and tin in alkaline electrolytes. Zhur.
fiz. khim. 35 no.2:420-425 P '61. (MIRA 16:7)

1. Ural'skiy institut Chernykh metallov i Ural'skiy
politehnicheskii institut imeni Kirova, Sverdlovsk.
(Tin) (Zinc) (Electrochemistry)

KRUGLOV, A.N., kand.tekhn.nauk; KOCHERGIN, V.P., kand.khimicheskikh nauk

Tinning of cold-rolled sheet steel in sulfuric acid solutions
using a reverse current. Sbor. trud. TSNIICHH no.28:101-108
'62. (MIRA 15:11)
(Sheet steel) (Tin plating)

KOCHERGIN, V.P., kand.khimicheskikh nauk; KRUGLOV, A.N., kand.tekhn.nauk

Hydrogen supertension on tin in a sulfuric acid solution containing sodium fluoride. Sbor. trud. TSNIICM no.28:113-120 '62.

(MIRA 15:11)

(Tin plating)

KOCHERGIN, V.P.; KOKOUROVA, E.G.

Oxidation of iron in melts containing lithium, sodium, and
potassium carbonates. Zhur.neorg.khim. 7 no.11:2563-2567
N '62. (MIRA 15:12)
(Iron) (Oxidation)
(Alkali metal carbonates)